Benchmarking information needs and use in the Tennessee public health community*

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Objective: The objective is to provide insight to understanding public health officials' needs and promote access to data repositories and communication tools.

Methods: Survey questions were identified by a focus group with members drawn from the fields of librarianship, public health, and informatics. The resulting comprehensive information needs survey, organized in five distinct broad categories, was distributed to 775 Tennessee public health workers from ninety-five counties in 1999 as part of the National Library of Medicine–funded Partners in Information Access contract.

Results: The assessment pooled responses from 571 public health workers (73% return rate) representing seventy-two of ninety-five counties (53.4% urban and 46.6% rural) about their information-seeking behaviors, frequency of resources used, computer skills, and level of Internet access. Sixty-four percent of urban and 43% of rural respondents had email access at work and more than 50% of both urban and rural respondents had email at home (N = 289). Approximately 70% of urban and 78% of rural public health officials never or seldom used or needed the Centers for Disease Control (CDC) Website. Frequency data pooled from eleven job categories representing a subgroup of 232 health care professionals showed 72% never or seldom used or needed MEDLINE. Electronic resources used daily or weekly were email, Internet search engines, internal databases and mailing lists, and the Tennessee Department of Health Website.

Conclusions: While, due to the small sample size, data cannot be generalized to the larger population, a clear trend of significant barriers to computer and Internet access can be identified across the public health community. This contributes to an overall limited use of existing electronic resources that inhibits evidence-based practice.

INTRODUCTION

Public health informatics is defined by Yasnoff and O'Carroll [1] as the ''systematic application of information and computer science and technology to public health practice, research, and learning that integrates public health and information technology.'' Public health informatics as an emerging discipline has achieved increased visibility in the medical information community over the past several years. In 1988, the Institute of Medicine's *The Future of Public Health* reported that the nation's public health system was in ''trouble'' and ''disarray.'' The report further charged that the public health system was incapable of ''applying fully current scientific knowledge'' and ''generating new knowledge, methods, and programs'' [2].

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Over fourteen years later, public health is still plagued by an underuse of information and technology, and the literature regarding public health information needs and information-seeking behavior is in its infancy. Even though a National Health Information Infrastructure (NHII) was proposed in 1995 [3], the interim report published in June 2000 admitted that the NHII did not exist in any ''comprehensive'' way [4]. The NHII is the set of technologies, standards, applications, systems, values, and laws that support all facets of individual health, health care, and public health. The vision of NHII is to deliver information to individuals—professionals as well as consumers and patients—when and where they need it, so they can use this information to make informed decisions. The American Medical Informatics Association (AMIA) Congress in 2001 advocated the rapid development of informatics in the public health community to face the new challenges of ''bioterrorism, emerging infections and antibiotic-resistant organisms'' [5]. A 2002 report from the Institute of Medicine, The Future of the Public's Health in the 21st Century, contended that underfunding, lack of political support, and unprepared workers contributed to this inadequate system, and, in fact, the executive summary stated that a ''majority of government public health workers have little or no training in public health'' [6]. Public health agencies adopted technology early but created separate, narrow applications that could not be integrated into other systems [7]. The telecommunication infrastructure necessary to deliver an information system to support small rural communities across the United States was missing in 1999.

AMIA recommends federally funded, dedicated, high-speed Internet access for all public and private health care facilities and related organizations [8]. To improve the nation's health outcomes, public health officials need to employ data systems containing individual and community information across jurisdictions and exchange these data to implement effective policies to avert acute events as well as address chronic diseases. Despite the strong calls for greater access to technology and training for public health workers, few formal studies of information needs and information-seeking behaviors in the community have been reported. To benchmark current public health information use and to develop training options for the information problems besetting public health, agencies including the National Library of Medicine have formed a coalition, the Partners in Information Access for Public Health Professionals, and have initiated a series of contracts to promote information use and Internet connectivity in the public health community. The Eskind Biomedical Library (EBL) at Vanderbilt University Medical Center (VUMC) was awarded an eighteen-month contract in 1999. This paper introduces the project's goals and presents findings from the EBL's assessment of the Tennessee public health community's information-seeking behaviors and needs.

BACKGROUND

Perhaps more than any other group of health professionals, public health workers embody the concept of diversity. The field of public health draws workers from the disciplines of nursing, health education, epidemiology, toxicology, environmental health, social work, nutrition, inspection, administration, and clinical medicine [9]. Among and within these subgroups, there are differing levels of education, different cultural practices, and a wide array of information-use styles [10]. Reflecting this heterogeneity, public health professionals' information needs do not fall into one domain. Rather, they include such diverse subject matters as air and water quality, violence prevention, day care and boarding home oversight, hospital regulation, smoking prevention, migrant health, food safety, sewage disposal, animal control, hazardous waste management, and many others [11]. The quality of information available on these subjects varies widely, as do the abilities of individual public health professionals to retrieve and judge information quality. Moreover, existing technologies for accessing important information resources have limitations, not only in terms of use and retrieval but also in terms of availability in rural and remote areas. As a result of all these factors, public health professionals need improved training, access, connectivity, and awareness of information resources and quality.

Despite their diversity, public health professionals share common training needs, including how to search effectively, how to evaluate the quality and authority of online information, where to search for different kinds of data, how to implement best practice information, and how to use information technologies for effective communication [12]. Although attention is being paid to public health training needs and information access through collaborations like the Partners in Information Access for Public Health Professionals [13–15] information awareness projects and national conferences such as the AMIA Spring 2001 Congress [16] to develop a national public health informatics agenda, few studies report the methods, the sources, or the frequency of information used by public health professionals. As Humphreys remarks, ''few would argue that those seeking health policy or public health information are as well served as those seeking information relevant to clinical care or basic biomedical research'' [17]. There is a dearth of formal studies of information needs and information-seeking behavior in health policy and public health, but available evidence suggests that many factors inhibit access [18].

The available studies generally surveyed connectivity or education needs. For instance, Hollander and Martin assessed equipment availability, Internet access, staff use of the Internet, and training opportunities among 348 Midwestern local health departments (LHD) in 1997 [19]. One summary questionnaire was sent to 713 LHDs in ten states, and the respondent in each LHD answered for the entire staff. These authors noted that 85% of LHD respondents had access to at

least one Internet-capable computer. The National Association of County and City Health Officials (NACCHO) 1999 survey of health departments levels of access to the Internet found that, while larger health departments often had access to the Internet, connections were rarely high speed or available to all staff. Significantly, the survey reported that 25% of health departments serving smaller jurisdictions lacked Internet access altogether [20]. This survey did not report individuals' methods or levels of access.

Gale [21] surveyed Washington state public health professionals regarding their training needs; one of the highest-rated needs was for training in electronic communication, which the authors did not define but noted could range from email communication to using the Internet for research. Similarly, O'Carroll [22] used a focus group of twenty-three health policy makers from across the country to investigate needs, and Rambo [23] surveyed seventy public health officials to identify information needs and information-seeking behaviors in the Washington state public health workforce. Chambers [24] queried members of a segment of the Canadian public health workforce about their use of various information resources.

Forsetlund and Bjorndal [25] conducted focus groups with fifty-two Norwegian public health practitioners (M.D.s) and an observational study of six of these public health physicians. Using the focus groups, the researchers identified cases in which searching for research-based information was appropriate and noted if these practitioners perceived and identified the same cases. The practitioners felt that many cases called simply for professional judgment, as opposed to evidence-based knowledge, and their general consensus was that they rarely had occasion to deal with questions requiring research-based information. These authors established that the practitioners were not opposed to using research for environmental issues, for example, but thought that evidence-based public health did not really apply to ''management and organization.'' Forsetlund and Bjorndal were able to identify at least six clear cases of problems that qualified for research-based information that the practitioners did not recognize in the focus group observation. During the six practitioner observation periods, Forsetlund and Bjorndal identified twenty-two more cases of questions where research could be used to support decision making, while the Norwegian public health practitioners did not identify *any* questions where research was necessary. These investigators concluded that generating research questions was not a common approach in public health practice [26]. This study provided evidence that framing objectives to measure public health outcomes could help provide incentives to use evidence-based research.

Other authors have also proposed methods to integrate electronic information resources into public health practice [27–29]. This paper will add to this small but growing body of knowledge of information-seeking behavior among a diverse group of public health officials through discussing the EBL's partners–funded effort to benchmark the awareness of vital information resources in the Tennessee public health community.

TRAINING PARTNERS FOR TENNESSEE PUBLIC HEALTH

The broad goals of the EBL's project are to increase the quality and quantity of awareness and usage of online information resources among Tennessee public health professionals, increase communication in the public health professional community, and increase what is known about how public health professionals use online information sources. In support of these broad goals, the project's specific objectives are to (1) develop and expand partnerships between EBL and public health organizations in the target region; (2) provide instruction, training, and support in the use of online resources and services such as PubMed and LoansomeDoc to targeted members of the public health community; (3) increase public health professionals' awareness of National Library of Medicine grant opportunities and other methods of bringing online connectivity to their home organizations; and (4) provide an online forum for public health professionals to access relevant resources and communicate with each other.

To achieve these aims, the EBL initiated several parallel strategies including developing the Training Partners for Tennessee Public Health (TPTPH) partnership [30], a broad-based coalition of the EBL, state and metropolitan health departments, a university-centered public health policy group, and the Area Health Education Center (AHEC) program of Tennessee. Other strategies included implementing a comprehensive information-needs assessment, a statewide video teleconference to broadcast information about training and grant writing opportunities, multiple training sessions, a Website, and a mailing list to foster communication in the public health community.

This paper addresses the results of the initial information-needs assessment conducted in October 1999 in preparation for developing the training session curriculum and the TPTPH Website. Over the course of the project, the EBL trained approximately 180 Tennessee public health workers in: (1) basic Internet searching, (2) use of PubMed MEDLINE, (3) use of the Centers for Disease Control and Prevention (CDC) Wonder and other statistical repositories, (4) use of Health Information Tennessee and the National Center for Health Statistics, (5) location and assessment of model program Websites, and (6) electronic document delivery via LoansomeDoc. The key to developing this comprehensive training program was the EBL's benchmark information-needs and information-seeking behavior assessment.

METHODS

The authors developed the needs assessment using an iterative method of individual and focus group review (Appendix). After developing a straw-man assessment, we convened a group of leaders from the Tennessee state health department, the Davidson County Metropolitan Health Department, and Tennessee environmental agencies as well as academic preventive medicine to review and comment on the usefulness and relevance of the questions. To obtain a representative opinion on the survey, we also asked public health experts from both rural and metropolitan regions to review the revised assessment and then tested the newly modified survey with several individuals from the state and local health departments.

The assessment tool was divided into questions covering professional and demographic information including job category based on employment grades used by the state health department, race or ethnicity, education, number of years in the profession, and information use and information-seeking behaviors including the frequency of use and type of resource used to locate information. We modified Rambo's [31] useful dissection of the categories of information generally employed in public heath (e.g., directory information, legislative information, health and environmental data, etc.) and asked respondents about their frequency of use of each category as well as frequency and type of nonelectronic (colleagues, news media, etc.) and electronic (CDC Wonder, Health Information Tennessee, etc.) resources used. We deliberately included a number of resources we felt were not likely to be heavily used, so that we could raise the community's awareness of these resources.

The survey queried respondents about their computer and information technology use, including questions about access to a computer and Internet connection, hours of computer use, and self-rated proficiency in various types of software. Respondents were asked to rate their preferred methods for learning (one-on-one, group sessions, etc.) and were queried about their grant-writing activities and interest in learning more about the grants process. Respondents were not ''proctored'' as they completed the survey, and, because the survey instrument was on paper, no ''required fields'' could be enforced, as they could be with an online survey. Because responses to many questions were dependent upon earlier questions, the number of responses varied substantially per question. Finally, the assessment concluded with space for respondent comments and open-ended questions about what resources or tools would enable respondents to work more efficiently.

Seven hundred seventy-five needs assessment questionnaires were distributed to individual public health workers at their workplaces, and 571 completed surveys from public health workers in seventy-two of ninety-five counties were returned for a response rate of 73%. Leaders from the Metropolitan Davidson County Health Department and Tennessee Health Department Bureau of Health Services guided the distribution of the sample to promote broad survey representation among public health professionals throughout the state.

The high survey return rate is a testament to the importance of collaborative partnerships in the EBL project. Not only did the partner contacts in the state and local health departments distribute the needs assessment, they encouraged their staff to complete the survey and collected completed surveys. The authors coded each survey with a distribution code and unique number to indicate in which of the thirteen health statistics regions the respondent worked; surveys were anonymous, but the codes allowed us to determine where response rates were lower and differentiate between urban and rural respondents. The questionnaire included 174 variables that we analyzed using SPSS™ version 10.0 to provide frequency data.

RESULTS

Demographics

The Tennessee Health Department Bureau of Health Services divides the state into thirteen statistical regions, six urban and seven rural. The six urban regions or counties are Davidson (Nashville), Shelby (Memphis), Hamilton (Chattanooga), Knox (Knoxville), Madison (Jackson), and Sullivan (Johnson City). Tennessee has a county-level health officer in each of the ninety-five counties in addition to a local county director and a board of health. These health regions are shown in Figure 1. Respondents were asked to select from twenty-five categories to describe their specific job functions, as shown in Table 1 (N = 553). The total number of six physician respondents listed in Table 1 is misleading, because physicians are represented in other categories such as epidemiologists, communicable disease investigators, dentists, and regional health directors. Nurses are represented in categories for nurse practitioner, nursing director, educators, and health education or health promotion worker. Table 2 (N = 560) shows the distribution between urban and rural regions of survey respondents and the level or jurisdiction where they worked. Fifty-four percent were from urban regions and 46% from rural regions. The majority of respondents worked at the city or county level. In urban regions, 65.5% work on the city or local or county level, while 55.3% of the rural sample worked on the city or local or county level. The slight difference in urban versus rural percentages varies between Table 1 and Table 2, because the response rate for job category (N = 553) is lower than the response rate for jurisdiction level (N = 560).

The education distribution shown in Figure 2 reveals 22% had either master's or doctorate degrees, while 38% had bachelor's degrees (N = 571). Seventy-seven percent of respondents were female and 23% male (N = 541). Twelve percent of respondents were African-American, while 86% listed themselves as white; very small percentages of respondents classed themselves as American Indian, Hispanic, Asian, or

Figure 1
Tennessee health regions

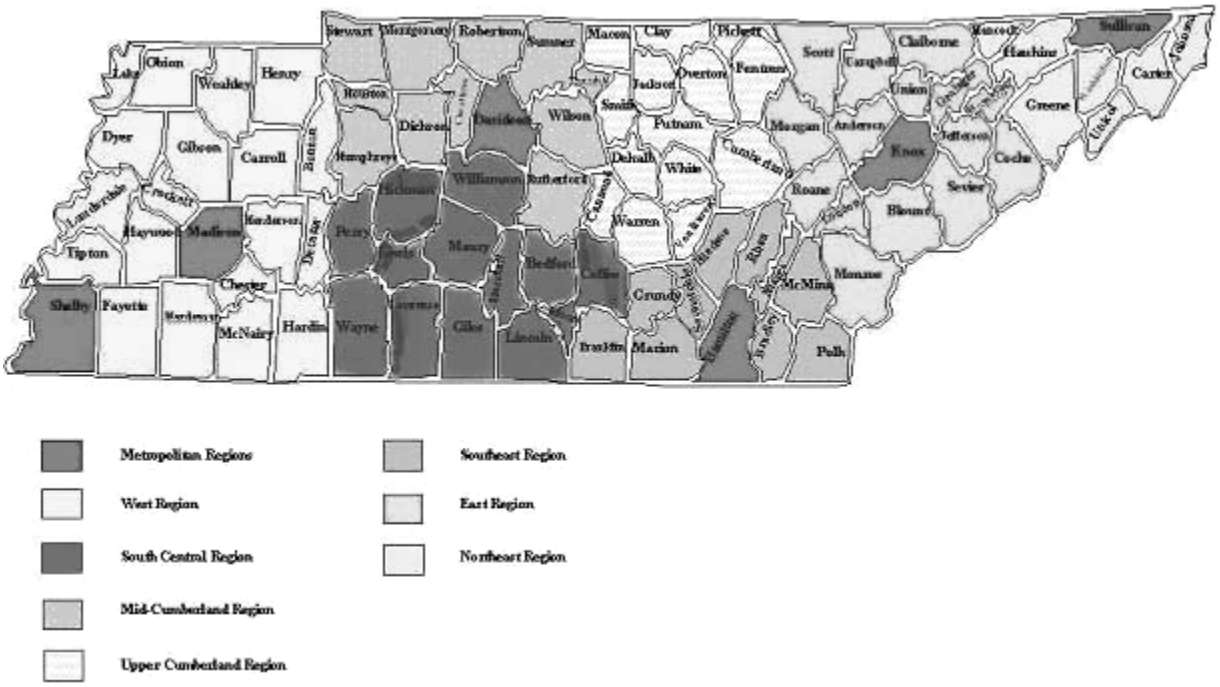


Table 1
Distribution of public health officials by job function (N = 553)

	Urban		Rural	
Job	%	N	%	N
Animal control	—	0	0.8	2
Communicable disease investigator	3.6	11	3.9	10
Community development or assessment worker	5.6	17	2.0	5
Counselor	2.0	6	1.2	3
Dental or oral services worker	3.6	11	2.0	5
Dietician or nutritionist	3.3	10	4.3	11
Educator	1.6	5	2.7	7
Environmental engineer	2.0	6	—	0
Environmentalist	7.2	22	1.2	3
Epidemiologist	1.6	5	—	0
Food inspector	2.3	7	0.8	2
Health education or promotion worker	4.6	14	5.5	14
Health safety inspector	0.7	2	0.4	1
Health officer	1.0	3	—	0
Lab technician	0.7	2	0.4	1
Nurse	14.1	43	19.2	42
Nurse practitioner	3.0	9	4.7	12
Nursing director	2.3	7	4.3	11
Physician	0.7	2	1.6	4
Program director: health department	13.4	41	7.5	19
Regional director: health department	1.0	3	3.9	10
Social worker	4.6	14	6.7	17
Staff support	5.6	17	18.0	46
Technical or computer support personnel	3.6	11	0.4	1
Other	11.5	35	8.6	22
Missing data	0.7	2	—	0
Total	100.3	305	100.1	248

Total percent not equal to 100 due to rounding.

Table 2
Urban versus rural health professionals: level of jurisdiction (N = 560)

	Urban region		Rural region	
Level	**%**	**N**	**%**	**N**
Local or city	33.8	103	9.4	24
County	31.8	97	45.9	117
Regional	27.5	84	20.8	53
State	3.6	11	18.0	46
Other	0.7	2	1.6	4
Missing	2.6	8	4.3	11
Total	100.0	305	100.0	255

other (N = 565). Ninety-seven percent of respondents used English language exclusively, while 3% used other languages such as Spanish, Sign, Thai, and Arabic in the workplace (N = 540).

Respondents were fairly evenly distributed in the number of years they have been employed in public health; a high number of respondents, almost 30%, indicated they had greater than twenty years of experience in the field. Twelve percent indicated they had sixteen to twenty years of experience, 19% had eleven to fifteen years, 14.71% had six to ten years, 20.49% had one to five years, and 3% had less than one year of experience (N = 571). Figure 3 outlines respondents' years of experience.

Computer and Internet access

We asked users to indicate *all* methods of computer access: machine at desk at work, shared machine at work, or machine at home. All local health departments in Tennessee had *at least one* Internet-capable office computer in 1999. However, no state email system was available for all health department employees at the time of the survey. The survey results showed that the number of individuals sharing computers was much higher than we expected. We defined a high frequency of sharing desktop computers as one-third of respondents in any job category. Frequencies in Table 3 do not add up to 100% because respondents could have checked all three methods if they had a computer on their desks but had to share it with others, in addition to having computer access at home. Table 3 shows respondents by job category who had access to the Internet at work or at home and the percent who had no access. Data shown in Table 3 are derived from only 394 respondents who answered a series of questions about both computer and Internet access.

Though a total of 553 respondents categorized their job function in Table 1, not all of these professionals answered the computer-related questions. The two animal control workers whose jobs were primarily in the field and who responded to this question had no access to a computer or the Internet either at work or home. Thus, a value of 100 in the ''No Access'' column of Table 3 is interpreted as no person in that job category had Internet access at any location. Seventy-five percent of nursing director respondents had desktop computer access compared to 50% of nurse practitioners. The nursing directors also showed a higher percentage of Internet access at work (81.3%), compared to nurse practitioners, of whom only 60% had Internet access at work. Only in the job categories of epidemiologists and environmental engineers did 100% of respondents indicate having a desktop computer *and* Internet access at work.

However, unlike the desktop computer–access questions, the Internet access data do not show if the individuals' Internet access was on their desktop or from a shared computer in the same office. The key partners

Figure 2
Educational distribution of respondents (N = 571)

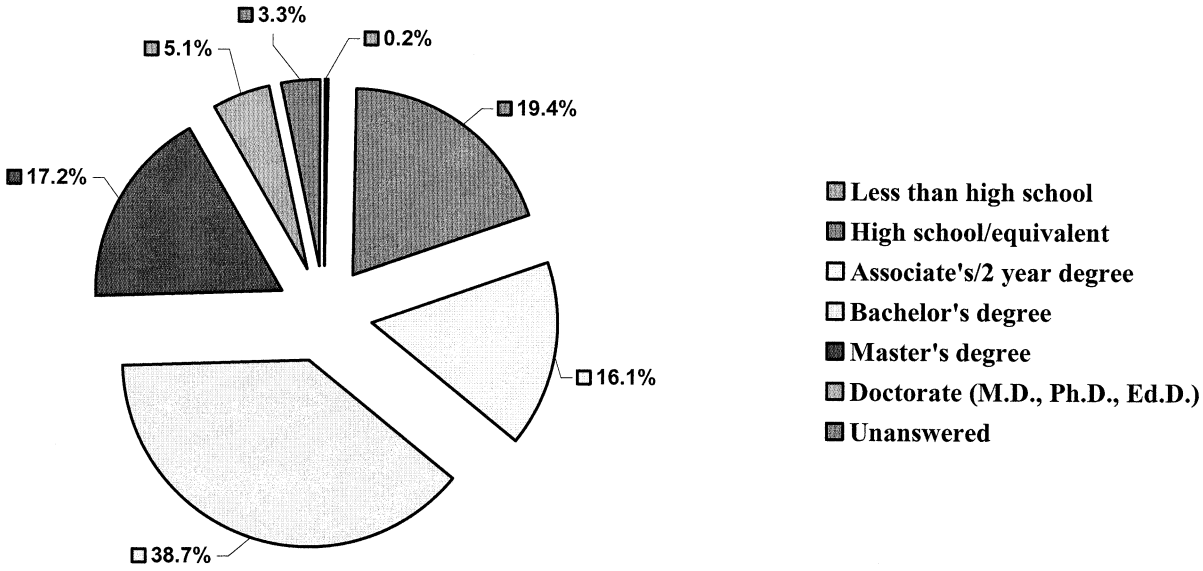


Figure 3
Public health workers: years of experience

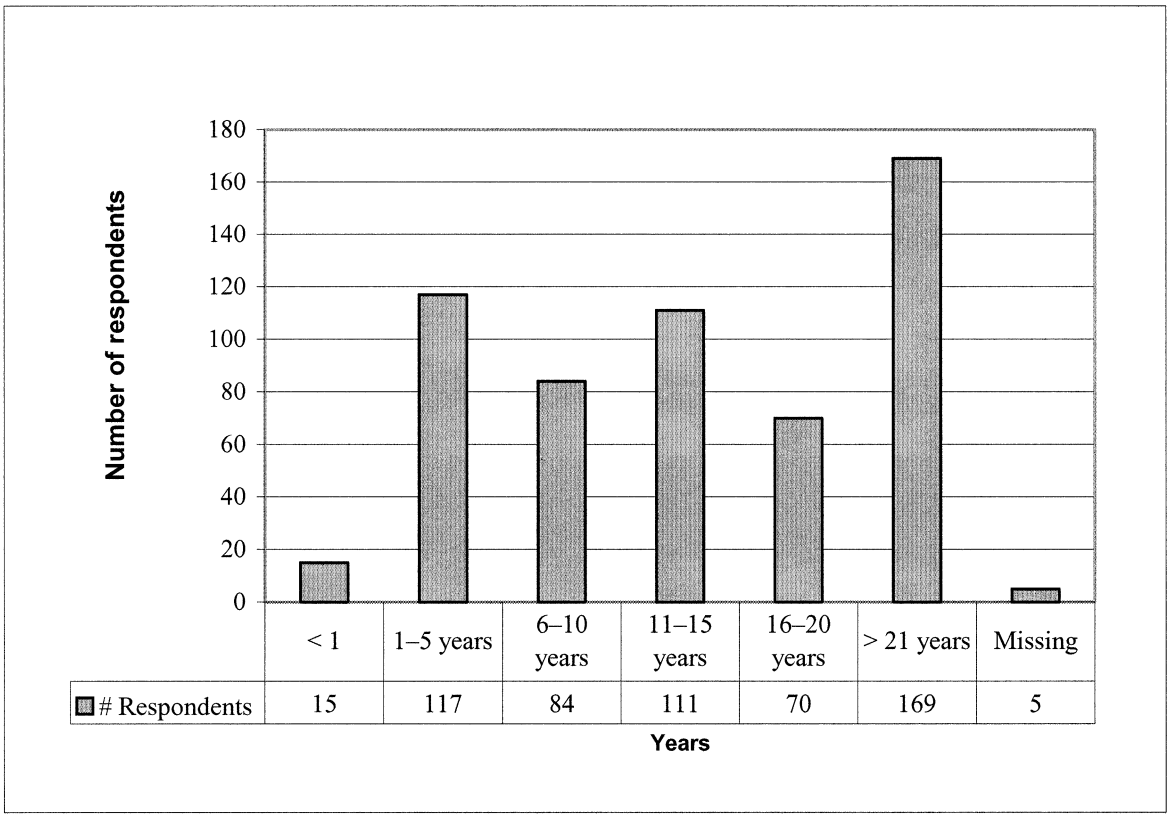


Table 3
Computer and Internet access by job function

Job	All methods of computer access (N = 394) % (N)			All locations of Internet access (N = 394) %		
	Desk	Shared machine at work	Home	Work	Home	No Access*
Animal control	— (2)	— (2)	— (2)	—	—	100.0
Communicable disease investigator	50.0 (8)	56.3 (9)	68.8 (11)	50.0	62.5	18.8
Community development assessment worker	95.0 (19)	5.0 (1)	80.0 (16)	75.0	75.0	5.0
Counselor	100.0 (7)	14.3 (1)	57.1 (4)	71.4	57.1	14.3
Dental or oral services worker	50.0 (5)	40.0 (4)	90.0 (9)	50.0	70.0	10.0
Dietician or nutritionist	36.4 (4)	63.6 (7)	81.8 (9)	36.4	81.8	18.2
Educator	85.7 (6)	42.9 (3)	71.4 (5)	85.7	85.7	—
Environmental engineer	100.0 (6)	— (0)	50.0 (3)	100.0	50.0	—
Environmentalist	50.0 (7)	50.0 (7)	64.3 (9)	64.3	64.3	7.1
Epidemiologist	100.0 (5)	20.0 (1)	100.0 (5)	100.0	100.0	—
Food inspector	12.5 (1)	87.5 (7)	50.0 (4)	50.0	50.0	12.5
Health education or promotion worker	68.0 (17)	36.0 (9)	76.0 (19)	56.0	64.0	12.0
Health safety inspector	33.3 (1)	66.7 (2)	66.7 (2)	66.7	66.7	—
Health officer	66.7 (2)	33.3 (1)	100.0 (3)	100.0	100.0	—
Lab technician	— (0)	100.0 (1)	100.0 (1)	100.0	—	—
Nurse	66.7 (22)	33.3 (11)	63.6 (21)	63.6	66.7	9.1
Nurse practitioner	50.0 (5)	30.0 (3)	80.0 (8)	60.0	80.0	10.0
Nursing director	75.0 (12)	31.3 (5)	93.8 (15)	81.3	87.5	—
Physician	100.0 (4)	50.0 (2)	75.0 (3)	75.0	75.0	—
Program director: health department	93.3 (56)	16.7 (10)	58.3 (35)	70.0	48.3	8.3
Regional director: health department	83.3 (10)	41.7 (5)	75.0 (9)	83.3	66.7	16.7
Social worker	80.0 (16)	40.0 (8)	50.0 (10)	60.0	40.0	25.0
Staff support	91.5 (43)	21.3 (10)	63.8 (30)	63.8	46.8	17.0
Technical computer support	100.0 (11)	54.5 (6)	90.9 (10)	90.9	72.7	—
Other	91.1 (41)	26.7 (12)	53.3 (24)	62.2	46.7	22.2

* Percentages do not total 100% due to multiple forms of access.

who reviewed the survey questions advised us that Internet access was not widespread throughout the regional offices and local health departments; therefore, we did not structure the survey to ascertain the number of individuals sharing Internet access in an office. Although two job categories had 100% of respondents with desktop computers and Internet access, we cannot conclude the Internet access was from the respondents' desktop computer.

Physicians, counselors, and computer support staff respondents had 100% access to desktop computers but did not all have Internet access from these machines. Several other job groups who had limited Internet access at work indicated having access at home: health officers, 100%; dieticians, 81.8%; health safety inspectors, 66.7%; dental or oral services workers, 90%; educators, 74.1%; and communicable disease investigators, 68.8%. Many respondents had multiple methods of computer access. It is important to note that though many had access through a shared computer at work, this computer could be the primary desktop of another worker, rather than an open-access machine found in a library. Access to the Internet at work did not necessarily mean exclusive use of the computer. Those who had desktop computers—such as nurses, 66.7%; nurse practitioners, 50%; and nursing directors, 75%—also indicated a high percentage of computer sharing. Another job category revealing a high frequency of computer sharing was social worker; while 80% had desktop access, 40% had to share and 25% had no access to the Internet at work or home. Values and frequencies shown in Table 3 reveal the small sample size in these job categories; however, the trend toward limited computer and Internet access is clear across most job groups. Of the twenty-five job categories in Table 3, fifteen, or almost two-thirds, showed a sharing frequency above 33%. The survey did not determine the number of individuals sharing a single computer. It is important to remember that in 1999 Internet service in many small communities in Tennessee did not exist, so the absence of home access was not necessarily by choice.

Many of these professionals were involved with direct patient care daily, so the survey queried respondents about hours of work-related computer use per week (other than patient system/data entry). The median number of hours of weekly computer use by epidemiologists was 40 hours; nursing directors, 5 hours; nurse practitioners, 2 hours; nurses, 5 hours; community assessment workers, 20 hours; environmental engineers, 15 hours; health educators, 10 hours; physicians, 5.5 hours; counselors, 20 hours; and communicable disease investigators, 5 hours. Though many workers shared computers, these data showed that, for most job categories, tasks requiring a computer were not their primary work activities.

Computer proficiency and email access

The survey also asked respondents to rate their computer expertise as beginner, intermediate, or advanced. Figure 4 indicates the urban versus rural respondents' self-ranking of their expertise (N = 384). Self-reported ''intermediate users'' in both urban and rural regions were similar, ninety and 127, respectively, but sixty-seven of the rural respondents rated themselves as beginners, while only sixty-two of the urban respondents rated themselves beginners. In marked contrast, only five of rural respondents considered themselves advanced users, while thirty-three of urban respondents self-reported as advanced users.

Sixty-four percent of the urban and 43% of the rural respondents had email access at work, and more than 50% of both urban and rural respondents had email at home (N = 289). Of those who did not have email in 1999, 94% of urban and 92% of rural respondents indicated they did want to use email (N = 143).

Grant-writing information

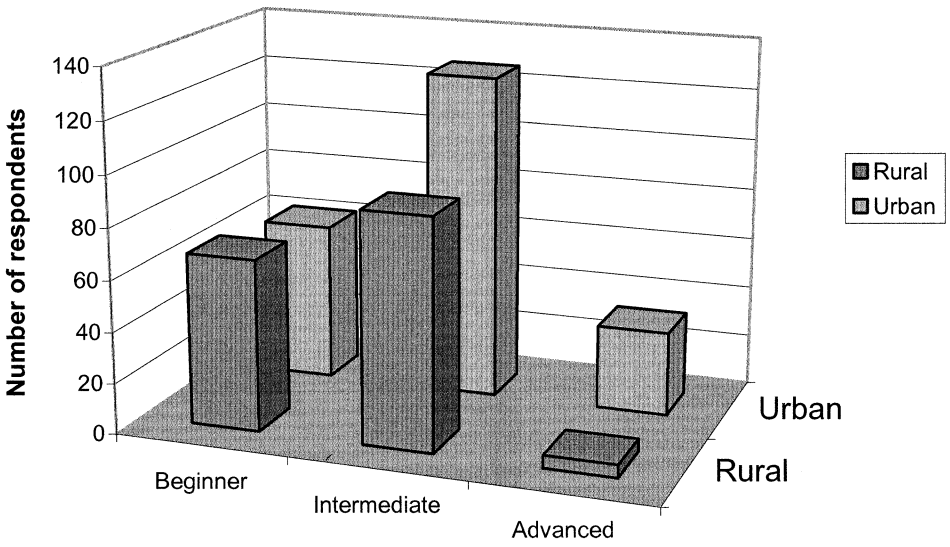
Twenty percent of respondents indicated they wrote grants; 0.05% noted that grant writing ''could be'' a job duty. The needs assessment also asked participants what grant-related training they desired. Of the 221 respondents who answered this question, 95% (N = 210) indicated they needed basic instruction in locating grant sources and the mechanics of writing a proposal. Other respondents noted they wanted instruction in administering a grant after its award, and a few listed specific kinds of grants they were seeking—health department construction funding, funding for housing facilities for alcoholics or substance abusers, and funding for health maintenance and education programs. One respondent desired instruction in writing outcome-based goals and objectives and in designing evaluation strategies.

Information-seeking behaviors and resources used

We modified the public health information categories described by Rambo [32] to ask respondents to indicate how often they used various categories of information. This paper presents a subset of the voluminous frequency data for each of these resources. Frequency data from selected questions give us insight into the information-seeking habits of the respondents. We asked respondents whether they used any of the following methods to locate information (respondents could select as many methods as applied): looking for information themselves, asking an assistant to locate information, asking a colleague to locate information, or asking a librarian to locate information. Not surprisingly, 95% of respondents (N = 542) indicated they looked for information themselves. Just 24% asked assistants to locate information, and, as is often seen in the biomedical community, overall 65% of respondents noted they asked colleagues for information.

The survey briefly defined each resource category and left room for respondents to add categories if they desired. The most frequently consulted categories of information included directory information (telephone numbers/addresses, schedules for official meetings, events, etc.), used daily by 51% of respondents, and internal communications (telephone calls, memos,

Figure 4
Self-ranking of computer expertise (N = 384)



	Beginner		Intermediate		Advanced	
	%	N	%	N	%	N
Rural	41.3	67	55.5	90	3	5
Urban	27.9	62	57.2	127	14.8	33

etc.), used daily by 62% of respondents (N = 553). Many respondents, 24%, also used internal documents such as unpublished reports, manuals, and policies daily, and 24% of respondents indicated they used information about their computers daily.

Health professional subgroup usage of electronic resources

Pooled responses from fourteen job functions encompassing individuals in clinical medicine, nursing, epidemiology, and public health services management were targeted for a subgroup analysis to focus on their information-seeking habits as opposed to the broader diverse population. Jobs selected for this analysis were: communicable disease investigator, community development assessment, counselor, dental or oral services worked, dietician, educator, health education or promotion worker, nurse, nurse practitioner, nursing director, physician, program director, regional director, and social worker. Data in Table 4 show this subgroup analysis of responses from the major health profession categories, revealing usage and frequency of major resources critical to the public health mission. The survey form divided frequency into five categories: never, seldom, monthly, weekly, and daily, but the subgroup analysis collapsed frequency into three groupings, ''Never or Seldom,'' ''Monthly,'' and ''Weekly or Daily.'' Results revealed that the top five electronic resources used weekly or daily were: email, 44.8%; Internet search, 35.8%; internal databases, 29.3%; mailing lists and email discussion lists, 16.4%; and Tennessee Department of Health Website 15.9%. The CDC was ranked sixth, with 6.5% using the site daily or weekly. The five sites most frequently identified as never or seldom used are: (1) Environmental Protection Agency (EPA) Website, 85.8%; (2) Census Bureau, 85.3%; (3) Food and Drug Administration (FDA) Website, 82.3%; (4) Agency for Health Care Policy and Research (AHCPR), 81.9%; and (5) National Center for Health Statistics (NCHS), 81%. CDC Wonder was never or seldom used by 80.6% and Health Information Tennessee (HIT) by 74.6%. Table 4 also reports frequency of missing values or no response for the resource, because, in some cases, these numbers are large.

Nonelectronic resources: urban versus rural

The survey asked respondents to indicate how frequently they consulted various *nonelectronic resources* for information. Table 5 shows the summary results subdivided by urban or rural respondents. Colleagues were among the most frequently used resources for information, with 60% of urban respondents and 65% of rural respondents consulting colleagues daily,

Table 4
Frequency of use of electronic resources by subgroup of major health professions (N = 232)

Electronic resource	Frequency % (N)			
	Never or seldom	Monthly	Weekly or daily	Missing
Internal or department databases	46.1 (107)	9.1 (21)	29.3 (68)	15.5 (36)
Agency for Health Care Policy and Research (AHCPR) Website	81.9 (190)	5.2 (12)	0.9 (2)	12.1 (28)
Centers for Disease Control and Prevention (CDC) Wonder	80.6 (187)	2.6 (6)	3.4 (8)	13.4 (31)
Census Bureau Website	85.3 (198)	0.9 (2)	0.4 (1)	13.4 (31)
CDC Website	72.4 (168)	9.5 (22)	6.5 (15)	11.6 (27)
Environmental Protection Agency (EPA) Website	85.8 (199)	0.4 (1)	2.2 (5)	11.6 (27)
Food and Drug Administration (FDA) Website	82.3 (191)	2.6 (6)	2.2 (5)	12.9 (30)
Health Information Tennessee (HIT) Website	74.6 (173)	6.9 (16)	5.2 (12)	13.4 (31)
MEDLINE	72.0 (167)	4.7 (11)	4.3 (10)	19.0 (44)
National Center for Health Statistics (NCHS) Website	81.0 (188)	2.6 (6)	0.4 (1)	15.9 (37)
National Institutes of Health (NIH) Website	78.0 (181)	4.3 (10)	0.4 (1)	17.2 (40)
Occupational Safety and Health Administration (OSHA) Website	80.6 (187)	4.3 (10)	0.9 (2)	14.2 (33)
Tennessee Department of Health Website	62.5 (145)	10.3 (24)	15.9 (37)	11.2 (26)
Other database search	63.8 (148)	9.5 (22)	6.0 (14)	20.7 (48)
Internet search	41.8 (97)	9.9 (23)	35.8 (83)	12.5 (29)
Email	41.8 (97)	2.6 (6)	44.8 (104)	10.8 (25)
Mailing lists, email discussion lists, electronic bulletin	62.1 (144)	4.7 (11)	16.4 (38)	16.8 (39)

Major health profession subgroup: communicable disease investigators, dental or oral services workers, dieticians, epidemiologists, health officers, nurses, nurse practitioners, nurse directors, physicians, program directors: health department, and regional directors: health department.

shown in question 1 of Table 5. Personal or departmental books were highly used resources as well, with 52.8% of urban respondents consulting books daily or weekly and 62.7% rural consulting personal collections either daily or weekly (Table 5, question 2). Dependence upon mass media (including newspapers, radio, and television), shown in Table 5, question 3, was not surprising, because public health services work is frequently ''complaint-driven'' and reported in mass media. The distribution between urban and rural areas did not vary substantially.

Libraries and electronic resources use: urban versus rural distribution

Table 6 reports frequency categories: never, seldom, monthly, weekly, or daily and the urban versus rural distribution of all respondents (N = 571) for nine resources recognized as important for public health officials. Question 1 in Table 6 documents the low use of libraries. More than 58% (58.4%) of urban and 70.9% of rural respondents never or seldom use libraries to find information. Currently, academic medical library collections are located in Memphis, Nashville, Knoxville, and Johnson City. Public health officials in the counties surrounding Nashville can pur-

Table 5
Frequency of use of non-electronic resources (N = 571)

	Frequency of response %					
	Never	Seldom	Monthly	Weekly	Daily	Missing
Question 1: How often do you use colleagues and personal contacts to find work-related information?						
Urban	1.0	4.6	6.6	26.2	60.0	1.6
Rural	2.4	2.4	5.5	22.7	65.5	1.6
Question 2: How often do you use personal or department books to find work-related information?						
Urban	3.9	16.4	23.9	28.9	23.9	3.0
Rural	5.1	10.6	20.0	29.0	33.7	1.6
Question 3: How often do you use mass media to find work-related information?						
Urban	6.2	21.3	12.8	21.6	23.9	5.2
Rural	7.1	23.1	10.6	26.3	28.2	4.7

Table 6
Frequency data for libraries and electronic resources: urban versus rural distribution (N = 571)

	Frequency of response %					
	Never	Seldom	Monthly	Weekly	Daily	Missing
1. How often do you use libraries to find work-related information?						
Urban	10.5	47.9	23.9	11.8	1.0	4.9
Rural	18.0	52.9	17.3	6.7	—	5.1
2. How often do you use the CDC Website to find information?						
Urban	47.2	23.6	9.8	7.5	1.6	10.2
Rural	59.6	18.8	8.6	3.5	0.4	9.0
3. How often do you use CDC Wonder to find information?						
Urban	59.3	20.3	3.9	3.3	1.3	11.8
Rural	72.2	12.2	2.4	2.7	0.8	9.8
4. How often do you use HIT Tennessee Website?						
Urban	53.1	21.3	8.5	3.6	2.6	10.8
Rural	60.0	16.5	10.6	2.7	0.4	9.8
5. How often do you use or need data at the county level?						
Urban	13.1	22.6	30.2	12.5	7.5	14.1
Rural	8.6	35.3	29.8	11.0	6.3	9.0
6. How often do you use or need health data at the state level?						
Urban	16.7	28.2	27.9	8.2	6.2	12.8
Rural	12.2	31.8	28.6	9.0	5.5	12.9
7. How often do you use the National Center for Health Statistics Website?						
Urban	63.3	18.4	3.6	1.6	—	13.1
Rural	73.3	12.2	2.0	0.4	—	12.2
8. How often do you use or need the published medical literature?						
Urban	26.6	25.9	20.3	15.1	3.6	5.6
Rural	29.4	25.5	17.3	14.5	4.3	9.0
9. How often do you use MEDLINE?						
Urban	62.6	13.8	3.6	3.6	0.7	15.7
Rural	68.2	10.6	3.5	2.4	0.4	14.9

chase an access card for the EBL. The Davidson County Metropolitan Health Department is the only health department in the state with its own library collection and full-time professional librarian.

Table 6 shows the responses from questions asking if the respondents either use or need the electronic resource or a specific type of health information. We wanted to determine if respondents use the appropriate electronic resource to meet an identified information need. Table 6, question 2, reveals that only about 9% of urban and 4% of rural respondents use the CDC Website either daily or weekly for information. Approximately 71% of urban public health officials never or seldom use the CDC Website, while 78% of rural respondents do not use this site. Still, the subgroup analysis of 232 health professionals reported in Table 4 showed 6.5% used the CDC site weekly or daily.

Health statistics data and Health Information Tennessee

In 1997, the Tennessee Health Department and University of Tennessee Knoxville, Community Health Research Group (UTK CHRG) [33], launched a new Website, Health Information Tennessee (HIT), containing health status reports from all thirteen regional health councils and ninety-five counties. A component of the HIT system, Statistical Profile of Tennessee (SPOT), has been designed so users may enter a query to retrieve vital statistics, staff numbers, facilities, and other health surveys by county accompanied by maps, plots, charts, or tables. Question 4 in Table 6 shows that only 14.7% of urban and 13.7% of rural users *use* the HIT site at least monthly, but question 5 shows that 50.2% of urban and 47.1% of rural respondents *needed or used* county-level data at least monthly. Clearly, the respondents recognize the need for health statistics data to support outcomes-based community planning; however, users apparently either do not recognize a relevant specific primary source or encounter obstacles in its use. Obviously, those who do indeed use county-level health data did not access the HIT site. The HIT resource has been specifically created to fulfill the need for county data. In fact, the HIT/SPOT Website has been available since early 1997 with death and survey data sets, followed by birth data. The HIT component MapMaker, online since 1999, allows users to construct thematic maps showing data distributions on county-level maps. Question 6 in Table 6 indicates that state health statistics data are used or needed at least monthly by 42.3% of urban and 43.1% of rural respondents. Tennessee summary data are available on the HIT site, but respondents are unable to correlate their expressed need with the most relevant resource.

Published medical literature

Question 8 in Table 6 regarding the published literature shows only 18.7% of urban and 19% of rural respondents needing or using medical information either daily or weekly (N = 571). Monthly use by 20% of urban and 17% of rural respondents is low considering the broad scope of the question (N = 571).

Question 9 in Table 6 (N = 571) shows the frequency of daily or weekly use for MEDLINE. Only 4.3% of urban and less than 3% of rural region respondents reported daily or weekly use. Over 60% of urban and rural respondents never use or need MEDLINE.

Other tools

The survey also included open-ended questions, including one asking which tools or resources would enable respondents to work better. Respondents often indicated multiple items (N = 285). One hundred twenty-two (43%) noted they would be best served by computer or Internet access, a finding which echoes recommendations from the AMIA 2001 Spring Congress that ''computers and information technology are part of public health practice, [and] computers should be on all desks'' [34]. Sixty-eight respondents (23.8%) indicated they needed training in basic computer use or concepts, and thirty-four (11.9%) desired access to specific software or training in specific software. Twenty-five respondents (8%) to the question noted they needed general Internet training, and lesser percentages indicated a need for more time, assistance, books or journals, data sources, or technical support.

DISCUSSION

The data document the overarching theme of reports of the information crisis in public health: significant diversity in education, job functions, computer access, and technology skills. Also, health department staff work in diverse areas, and many (possibly a majority) do not have exclusive access to a computer with Internet access on their desktop. Of the twenty-five job categories in Table 3, fifteen show a sharing frequency above 33%. We do not know if the sharing of one computer is between two professionals or some larger number. The public health workforce is large, and most individuals are unaffiliated with institutions with a professional materials collection, either print or electronic [35]. This limited access to equipment, the Internet, information, training services, and medical literature is an overwhelming obstacle to information seeking. As mentioned previously, Tennessee has only one public health library in a health department setting and no document delivery service to health policy makers in the state health department. This lack of affiliation decreases the awareness of the wealth of electronic and print materials and isolates health professionals responsible for improving health outcomes in large populations.

In addition, because many public health professionals work in the field, in the lab, or in direct contact with patients for many hours per week, they have less opportunity for exploring the Internet. Indeed, the results indicate that the high rate of computer sharing is an obstacle and that limited time at an office desktop further complicates public health professionals' ability to conduct Internet research. Low usage of electronic

resources is consistent with factors such as limited equipment, shared equipment with Internet connections, limited time during the work day for self-exploration, lack of awareness, limited access to libraries, and, perhaps most importantly, the perception that public health professionals' needs are not applicable to existing evidence-based electronic resources. One flaw in the survey is that we did not document the travel component of these professionals' job responsibilities. Travel time creates another obstacle limiting the time available for staff to learn computer skills, because the continuity of the learning process is broken into discontinuous segments.

Few resources or categories of information exceeded 50% of respondents' frequency of use or need; those that are rated most highly in terms of daily use included colleagues and internal communications such as telephone calls, memoranda, and personal conversations, all generally a part of the largely unrecorded, tacit body of knowledge that helps to comprise a professional culture.

These results bolster Lynch's assertion that ''the base of information needed [in public health] goes far beyond traditional published literature and encompasses a wide range of fugitive information and information created as a by-product of organizational and institutional operations'' [36]. Clearly, these respondents do not rely on a particular commercial resource or database to meet their information needs but use resources that are close at hand. Given these preliminary data, the public health community would be equally well served by altering their workflow to incorporate knowledge management principles to organize information for reuse, as well as increase use of electronic resources.

Results are derived from self-reported data, and the limitation of this approach is well recognized. The sample size is broad and is not representative in some job categories with a small number of respondents such as animal control workers, lab technicians, or health safety inspectors. However, these needs assessment data help us to understand the composition and information needs of a sampling of the Tennessee public health community. The assessment and the training sessions have laid a foundation of awareness of many information resources available to the public health community and engendered an idea of what types of resources and information behaviors would benefit public health in the library and information science community. Humphreys posits that the ability to use information services effectively depends on access to appropriate computer equipment and the Internet, awareness of available services that contain useful information, a core level of competence in the use of information technology and relevant information services, and help from experts (e.g., librarians or other information specialists) when it is needed [37]. Once an infrastructure of mutual awareness is in place, we can move toward building this ''core level of competence.'' Forsetlund's work with Norwegian public health physicians, however, shows the hesitation of these professionals to perceive and relate a question to published research for planning and management of public health issues. Failure to frame a question related to need will not be overcome by simply providing high-speed Internet desktop computers and raising awareness of existing electronic resources but by documenting direct applications of evidence-based knowledge to identified needs in this community.

Finally, we should not lose sight of the significance of the large budget and array of patient services managed by these professionals. According to the Tennessee budget, health department expenditures totaled $81 million in fiscal year 2001. The job responsibilities of some of the professionals who responded to this survey include management of: (1) patient care services for more than 820,000 Tennesseans in eighty-nine rural county health departments and six metro health departments, (2) multiple vendor contracts in the range of $100,000 to $500,000 each, and (3) program effectiveness. Yet, these management professionals share desktop computers and Internet access with an unknown number of coworkers. What other private company, nonprofit organization, or academic medical center would entrust such responsibilities to employees without the infrastructure to support communication and decision making?

FUTURE RESEARCH

While the results presented in this initial paper are frequency data, we are in the process of analyzing levels of self-reported knowledge of electronic resources indicated in pretest, posttest, and six-months after the survey evaluations for statistical significance to determine the value of group training. Most importantly, the EBL continues to collaborate with the Tennessee public health workforce. This initial project focuses mainly on raising awareness and documenting use through a broad needs assessment that both provides data for developing the training component of the project and has introduced, however passively, survey recipients to a variety of resources. Details of the training program and the use of resources afterward will be reported in subsequent papers. A single training session cannot instill knowledge of resources, and class participants quickly forget how to use resources unless they employ them frequently. To articulate a model to overcome this problem of knowledge fade as well as a model for building core competence atop an infrastructure of awareness, the EBL has embarked on a contract extension to experiment with developing in-house information expertise, as opposed to broad awareness, in the public health community.

Note: Since the initial survey was conducted in 1999, changes have significantly improved Tennessee public health workers' accessibility to information resources. Every county health department has the capacity to support at least five computers with Internet access. Virtually all public health workers have email accounts. Satellite dishes have been installed at every re-

gional health office and at the central office to facilitate satellite training.

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APPENDIX

Needs assessment questionnaire

TRAINING PARTNERS FOR TENNESSEE PUBLIC HEALTH

http://www.mc.vanderbilt.edu/publichealth/

ESKIND BIOMEDICAL LIBRARY@VANDERBILT UNIVERSITY MEDICAL CENTER ◆ TENNESSEE DEPARTMENT OF HEALTH ◆ METROPOLITAN HEALTH DEPARTMENT OF NASHVILLE AND DAVIDSON COUNTY ◆ AHEC PROGRAM OF TENNESSEE ◆ KNOX COUNTY HEALTH DEPARTMENT

Funded by the National Library of Medicine (N01-LM-6-3522), Training Partners for Tennessee Public Health (TPTPH) is a coalition of organizations dedicated to improving the Tennessee public health community's knowledge of electronic information resources. TPTPH will provide training in valuable electronic resources identified by the public health community. TPTPH will also provide a comprehensive website of public health information resources, an electronic mailing list for statewide communication, grant writing workshops, and a teleconference on a topic of interest to Tennessee's public health workers.

Please take a few minutes to complete this survey; completed surveys will be used to design training to help you use information better. If you have questions regarding this survey or the TPTPH project, please contact Nila Sathe at (615) 936-1418 or nila.sathe@mcmail.vanderbilt.edu.

A. PROFESSIONAL/DEMOGRAPHIC INFORMATION

1. Zip Code (work):_____ Zip Code (home):_____

2. At which level do you work: __local/city __county __regional __state __other: _____

3. Please indicate the category that most accurately describes your job function.

__Animal Control	__Communicable Disease Investigator
__Community Development/Assessment	__Counselor
__Dental/Oral Health Services	__Dietician/Nutritionist
__Educator	__Environmental Engineer
__Environmentalist	__Epidemiologist
__Food Inspector	__Health Department Administrator—Program Director
__Health Department Administrator—Regional Director	__Health Education/Promotion
__Health Officer	__Health/Safety Inspector
__Lab Technician	__Nurse
__Nursing Director	__Nurse Practitioner
__Physician	__Sanitation Engineer
__Social Worker	__Staff Support (secretary, administrative asst., etc.)
__Technical/Computer Support	__Other:

4. Please indicate your:

Highest level of education	__Less than high school __High school or equivalent __Associate's or 2 year degree __Bachelor's degree __Master's degree __Doctorate (MD, PhD, EdD)
Gender	__Male __Female
Race/Ethnicity	__American Indian or Alaskan Native __Asian American or Pacific Islander __Black/African American __Hispanic/Latino __White __Other
Experience in public/community health field	__less than 1 year __1-5 years __6-10 years __11-15 years __16-20 years __over 21 years
Do you speak a language besides English in your practice?	__yes __no If yes, what language(s)?

B. INFORMATION USE/NEEDS

1. How do you usually locate information? Check as many as apply.

____look for information yourself **____contact an information specialist/librarian**

____have secretary/assistant look for information **____other: _____**

____contact a colleague

2. Please indicate all categories of information you use/need on a regular basis; add those that are not listed.

CATEGORY	FREQUENCY OF USE: Daily	Weekly	Monthly	Seldom	Never	Interested in instruction? Yes	No
Directory/contact information (phone numbers/addresses, schedules for official meetings, events)							
Grants information (proposal requests)							
Health data (statistics, demographic information, trends, incidence, prevalence, etc.)							
City/local level							
County level							
State level							
National level							
Environmental data (air quality, water quality, etc.)							
City/local level							
County level							
State level							
National level							
Legislative/legal data (laws and administrative codes, Tennessee Code Annotated, etc.)							
Management information (information for planning, budgeting, supervising)							
Training, in-service, demonstration materials (tutorials, explanatory material)							
Model program/intervention information							
Published medical literature (information found in MEDLINE and other databases)							
Internal communications (memos, phone calls, etc.)							
Internal documents (unpublished reports, documents, policies, etc.)							
Information about your computer (software programs, etc.)							
Other:							

3. How often do you use the following resources to find work-related information? Please indicate other information resources you use frequently.

PRINT AND OTHER RESOURCES:	FREQUENCY OF USE: Daily	Weekly	Monthly	Seldom	Never
Colleagues/personal contacts (personal contact, phone calls, letters, email)					
Conferences/meetings					
Internal memos/reports/manuals/documents					
Mass media (newspapers, popular magazines, television, radio)					
Personal/departmental books/manuals					
Personal/departmental journals					
Libraries (public library, university/college libraries)					
State/federal agency reports/ documents/brochures (ex. CDC, EPA, etc. reports)					
Telephone directories (white pages, yellow pages, internal directories)					
PLEASE LIST ADDITIONAL PRINT OR OTHER RESOURCES YOU USE:					

ELECTRONIC RESOURCES:	FREQUENCY OF USE: Daily	Weekly	Monthly	Seldom	Never	Interested in instruction? Yes	No
Internal /departmental databases							
Agency for Healthcare Policy and Research (AHCPR) Website							
CDC Wonder							
Census Bureau Website							
Centers for Disease Control (CDC) Website							
Environmental Protection Agency (EPA) Website							
Food and Drug Administration (FDA) Website							
Health Information Tennessee (HIT) Website							
MEDLINE (Please indicate your access method—e.g. PubMed, Medscape, etc.:_____)							
National Center for Health Statistics Website							
National Institutes of Health (NIH) Website							
Occupational Safety and Health Administration (OSHA) Website							
TN Department of Health Website							
Other database search (statistical or medical literature databases)							
Internet (world wide web) search							
Email							
Mailing lists, listservs, electronic bulletin boards							
PLEASE LIST ANY OTHER ELECTRONIC RESOURCES YOU USE :							

C. COMPUTER/INFORMATION TECHNOLOGY SKILLS

1. **Do you use a computer for work other than entering data into a patient system or other data entry system? __Yes ___No. If no, skip to number 11.**
2. **If you use any of the electronic resources listed in section B above, where do you access them? ___Work ___ Home ___Other:_____**
3. **On average, how many hours a week do you use a computer, either at home or work, for job-related activities other than patient system or data entry? ___ Hours/week**
4. **Overall, how would you classify yourself as a computer user: ___Beginner ___Intermediate ___Advanced**
5. **Check all applicable methods of computer access: ___Your desk at work ___Shared machine at work __Home**
6. **Do you have an Internet Service Provider (ex. America Online, CompuServe)? ___ At work ___At home ___none**

7. **Do you know how to download data, software, or programs from the Internet? ___ Yes ___ No**
8. **Do you have an email account? ___ No ___ Yes, at work ___Yes, at home**
9. **If you do not currently have email, would you like to have it? ___Yes ___No If no, why? _____**

10. **Please indicate your proficiency in using the following software/computer programs:**

Program	No knowledge/ experience	Some knowledge/ experience	Sufficient knowledge to use program	Expert	Interested in instruction? Yes	No
Word processing (Word, Word Perfect)						
Spreadsheet (Excel, Lotus)						
Database (Access, Works)						
Web browser (Explorer, Netscape)						
Email						
Mailing list, listserv , electronic bulletin board						
Calendar/scheduling software						
Anti-virus (Norton, McAffee)						
Other utilities/functions (cut & paste, clipboard, etc.)						
Presentation software (PowerPoint)						
Document viewers (Adobe Acrobat)						
Desktop publishing (Publisher, Pagemaker)						
GIS (geographic info. systems software)						
Audio players (MP3, Real Audio)						
Full motion video (Quick Time, Shock Wave)						
Statistical Software (EpiInfo, SPSS)						
Electronic document delivery (DocView)						

11. **On a scale of 1-5, how do you learn best (1=preferred method, 5=least favorite method):**
___ **Experiment (trial & error)**
___ **One-on-one assistance**
___ **Read book/manual**
___ **Take a class**
___ **Use HELP/tutorial functions**
___ **Other: _____**

12. **What is the maximum amount of time you can allocate at one time to attend a hands-on training session?**
___ **Full-day** ___ **Half-day** ___ **2-3 hours** ___ **Other:_____**

D. GRANT WRITING INFORMATION

1. **Is participating in writing grant proposals a part of your job? __Yes __No**
2. **If yes, when did you/your organization last submit a grant? _____**
3. **Do you/your organization submit grants to __ public (government) or __ private agencies?**
4. **Please list the last 3 agencies to which you/your organization submitted grants:_____**
5. **Would you be interested in attending a grant writing workshop? __Yes __No**
6. **What kinds of grant-related training would be most beneficial to you (e.g. how to locate grant opportunities, what kinds of grants you should apply for, basic mechanics of writing a grant, etc.)?**

E. OTHER INFORMATION

1. **What information, tools, or resources, if available, would enable you to do your work better?**
2. **Other comments/suggestions:**
3. **Optional--Contact Information:**

Your Name: _____

Organization: _____

Phone Number:_____

Email:_____